Research Note No. 6

Essential Absence of β-Naphthylamine In Cigarette Smoke Condensate

R. L. Miller and R. L. Stedman
Eastern Utilization Research and Development Division,
Agricultural Research Service, USDA,
Philadelphia, Pa., U.S.A.

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Recent compositional studies on the nitromethane-soluble neutral fraction of tobacco smoke condensate showed the presence of several aromatic amines (1) which were probably formed by free radical reactions during burning. Allied reactions might be expected to produce other aromatic amines, some of which may be previously unreported smoke constituents with physiological activity, e.g. β-naphthylamine (NA).

The basic fraction of smoke condensate from commercial cigarettes was removed by HCl extraction (3) and the fraction was examined by gas chromatography (GLC) (4) and thin layer chromatography (TLC) (2, 5). No peak for NA could be observed using a thermal conductivity detector and single injections of bases equivalent to 38 cigarettes. Multiple injections of the bases were made and that portion of the chromatogram containing NA was collected in a single collection device. The collected fraction was then examined by TLC. A faint spot was obtained having the same R_f as authentic NA but definitive identification could not be made.

Authentic NA was added to smoke condensate at a level corresponding to 0.1 micrograms per cigarette and the condensate was subjected to the same isolation procedure. A spot was obtained on TLC corresponding to NA; although the percentage recovery could not be determined accurately, presence of NA was detectable. An identical run was made by separating NA alone. The procedure gave a recovery of about 40 percent. Most of the loss apparently occurs during the GLC separation.

Based on this recovery and the limits of detection of NA by the GLC and TLC methods, it appears that NA, if present at all in smoke condensate, occurs in levels less than 0.04 micrograms per cigarette in the condensate investigated.

Addendum: During preparation of this manuscript, a report appeared [M. Pailer, W. J. Hubsch and H. Kuhn, Fachl. Mitteil. Osterreich. Tabakreg. No. 7, 1 (1967)] which confirmed these findings using condensates from blended cigarettes of undescribed origin.

Literature Cited

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